

# Andrew T. Walter

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## Education

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<b>Northeastern University (NEU)</b> <b>Doctor of Philosophy, Computer Science</b> <ul style="list-style-type: none"><li>Advised by Panagiotis Manolios. 4.00 overall GPA.</li></ul>	Boston, Massachusetts ( <i>expected</i> ) <b>Fall 2024</b>
<b>Masters of Science, Computer Science</b> <ul style="list-style-type: none"><li>4.00 overall GPA</li></ul>	<b>June 2021</b>
<b>Worcester Polytechnic Institute (WPI)</b> <b>Bachelor of Science, Computer Science</b> <ul style="list-style-type: none"><li>Minor in Mathematical Sciences, 3.72/4.00 overall GPA</li></ul>	Worcester, Massachusetts <b>May 2018</b>

## Selected Publications

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<b>Walter, A. T., Kumar, A., &amp; Manolios, P.</b> “Proving Computational Proofs Correct,” in <i>ACL2 2023</i> , ser. EPTCS 393, 2023, 133-150. DOI <a href="https://doi.org/10.4204/EPTCS.393.11">10.4204/EPTCS.393.11</a>	<b>Nov. 2023</b>
<b>Walter, A. T., Greve, D., &amp; Manolios, P.</b> “Enumerative Data Types with Constraints,” in <i>FMCAD 2022</i> , 189-198. DOI <a href="https://doi.org/10.34727/2022/isbn.978-3-85448-053-2_25">10.34727/2022/isbn.978-3-85448-053-2_25</a>	<b>Oct. 2022</b>
<b>Walter, A. T. &amp; Manolios, P.</b> “ACL2s Systems Programming,” in <i>ACL2 2022</i> , ser. EPTCS 359, 2022, 134-150. DOI <a href="https://doi.org/10.4204/EPTCS.359.12">10.4204/EPTCS.359.12</a>	<b>May 2022</b>
<b>Walter, A., Cooper, S., &amp; Manolios, P.</b> “A Reasoning Engine for the Gamification of Loop-Invariant Discovery”. <i>Preprint</i> <a href="https://arxiv.org/abs/2109.01121">arXiv:2109.01121</a> .	<b>(preprint) Sept. 2021</b>
<b>Walter, A. T., Boskin, B., Cooper, S., &amp; Manolios, P.</b> “Gamification of Loop-Invariant Discovery from Code,” in <i>HCOMP 2019</i> , 188-196. DOI <a href="https://doi.org/10.1609/hcomp.v7i1.5277">10.1609/hcomp.v7i1.5277</a>	<b>Oct. 2019</b>

## Professional Experience

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<b>Member of Technical Staff – Intern, Rivos Inc.</b> Performed formal verification work on processor RTL.	<b>May 2023 – Sept. 2023</b>
<b>Applied Science Intern, Amazon</b> Explored the feasibility of using code analysis tools to track data across cloud applications.	<b>May 2022 – Sept. 2022</b>
<b>PhD Student, NEU</b> Researching how to make theorem provers more accessible and more usable in a variety of applications. See <i>Projects</i> for PhD work.	<b>Sept. 2018 – Present</b>
<b>StarLogo Nova Research, WPI Bioinformatics Department</b> Developed a debugging tool for use within the StarLogo Nova online agent-based modeling program.	<b>May 2017 – August 2018</b>
<b>Big Data Intern, Rakuten USA</b> Implemented a tool for visualizing data about searches on Rakuten’s U.S. online marketplace.	<b>May 2016 – August 2016</b>
<b>Software Quality Assurance Intern, Brooks Automation</b> Designed and executed a test plan for controller software for automated robotic systems. Interfaced software with an external sensor.	<b>May 2015 – August 2015</b>

## ***Projects***

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<b>Formal Model of the RISC-V ISA, NEU</b> Developing a formal model of a subset of the RISC-V ISA in ACL2s.	<b>Nov. 2020 – Present</b>
<b>Witness Generating Data Types, NEU</b> Developing a data-type framework that enables efficient witness generation, for use in fuzzing and counterexample generation.	<b>June 2020 – Present</b>
<b>CS2800 Proof Checker, NEU</b> Developed and evaluated a tool designed to check semi-formal proofs produced by students in the CS2800 Logic and Computation course.	<b>Jan. 2020 – Present</b>
<b>Lisp-Z3 Interface, NEU</b> Developed a low-overhead Lisp interface for the Z3 SMT solver, and used it to implement an efficient fuzzer for a subset of the WiFi protocol.	<b>June 2020 – Present</b>
<b>Model-Based Protocol Fuzzing, NEU</b> Investigated several different methods for developing automated fuzzers for complex protocols using ACL2s.	<b>Dec. 2018 – Sept. 2020</b>
<b>Crowdsourced &amp; Gamified Loop Invariant Discovery, NEU</b> Created and evaluated a game intended to allow non-specialists to help a theorem prover discover loop invariants.	<b>Sept. 2018 – Present</b>
<b>Techniques of Programming Language Translation, WPI</b> Wrote a compiler for Dijkstra, a simple language that targets the JVM. Outside of class, rewrote the compiler in Rust to target LLVM.	<b>Jan. 2017 – May 2017</b>

## ***Teaching***

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<b>Teaching Assistant, NEU</b> CS2800 – Logic and Computation	<b>Sept. 2022 – Dec. 2022, Jan. 2022 – May 2022, Jan. 2021 – May 2021, Jan. 2020 – May 2020</b>
<b>Student Assistant, WPI</b> CS2011 – Introduction to Machine Organization and Assembly Language, CS2303 – Systems Programming Concepts, CS210X – (experimental) Accelerated Object Oriented Design Concepts CS2301 – Systems Programming for Non-Majors, CS1004 – Introduction to Programming for Non-Majors	<b>Mar. 2018 – May 2018 Jan. 2018 – Mar. 2018 Oct. 2017 – Dec. 2017 Mar. 2017 – May 2017 Jan. 2016 – Mar. 2017, Oct. 2016 – Dec. 2016</b>

## ***Selected Coursework***

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**NEU:** Special Topics in Formal Methods, Theory of Computation, Computer Architecture  
**WPI:** Techniques of Programming Language Translation, Programming Languages, Data Analytics and Statistical Learning, Software Engineering, Analysis of Algorithms, Operating Systems

## ***Skills***

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**Programming Languages:** ACL2, Python, R, Java, C/C++, C#, JS + Angular, TypeScript, Common Lisp, Bash, LaTeX, Scala, Rust, x86 & RISC-V assembly, Coq, SystemVerilog, TCL

**Applications/Services:** git, Jasper, Z3, Amazon EC2, Apache 2, nginx, LLVM, Xtext, Docker, Eclipse, SLURM, FuseSoC